

## PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

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To:

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24/4  
**PCT**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43 bis.1)

Date of mailing 01 July 2004 (01.07.2004)  
(day/month/year)

Applicant's or agent's file reference Neikov 04-6	<b>FOR FURTHER ACTION</b> See paragraph 2 below	
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International application No. PCT/BG 2004/000006	International filing date (day/month/year) 17 March 2004 (17.03..2004)	Priority date (day/month/year) 17 March 2003 (17.03.2003)
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International Patent Classification (IPC) or both national classification and IPC F16H 48/26
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Applicant GANCHEV, Stilian
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## 1. This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Rule 43bis. 1 (a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

## 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/RU FIPS Russia, 123995, Moscow, G-59, GSP-5, Berezhkovskaya nab., 30-1 Facsimile No.	Authorized officer
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Telephone No.
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G. Kuznetsova

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Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

This opinion has been established on the basis of a translation from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- a sequence listing  
 table(s) related to the sequence listing

b. format of material

- in written format  
 in computer readable form

c. time of filing/furnishing

- contained in the international application as filed.  
 filed together with the international application in computer readable form.  
 furnished subsequently to this Authority for the purposes of search.

3.  In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

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**Box No. V Reasoned statement under Rule 43bis.l(a)(i) with regard to novelty, inventive step or  
Industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Claims _____	1-5 _____	YES
	Claims _____		NO
Inventive step (IS)	Claims _____	1-5 _____	YES
	Claims _____		NO
Industrial applicability (IA)	Claims _____	1-5 _____	YES
	Claims _____		NO

**2. Citations and explanations:**

Upon the preparation of the written opinion of the international Searching Authority there were used the following documents, cited in the Search Report:

D1 : WO 2000/28240 A1,  
D2 : SU 291815 A,  
D3 : US 2789447 A,

There is declared a control device for a hydraulic differential , which is characterized in the scope of Claim 1 to 5 of the Patent Claims of the invention.

A control device for a hydraulic differential, declared in accordance with Claim 1, is characterized in that it contains two integrated within the common driving unit of the hydraulic differential control hydraulic loops having a distributor embodied as a common gate mechanism, wherein each of the hydraulic loops includes two main collectors of toroidal configuration, and control branches with electromagnetically actuating of their control elements, besides, the gate of the main distributor represents by itself a rotating body in a form of a cylinder having an axial opening , wherein at equal distances from the ends of the cylinder two identical discs thinned towards their periphery are formed in such a manner that the gate is symmetrical with respect to the plane crossing perpendicularly the middle of its longitudinal axis, and the interior of the body of the main distributor has the same parameters of symmetry and it is configured in such a manner that only in a neutral position of the gate at both sides of each disc separate chambers insulated from each other are formed, wherein the chambers at each side of the gate are connected with areas of high and low pressure in separate hydraulic loops in such a manner that the pressures of both loops have opposite directions to the discs of the gate along its longitudinal axis, and the cross point of the longitudinal axis of the gate and its transverse plane of symmetry lies on this side of the rotating axis of the differential which crosses its common driving unit.

A control device for a hydraulic differential , disclosed in D1, is the closest analogue with respect to the device, declared in accordance with Claim 1, and comprises two control hydraulic loops, which are integrated within the common driving unit of the hydraulic differential, have a distributor, which is embodied as a common gate mechanism and control branches.

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**Supplemental Box**

In case the space in any of the preceding boxes is not sufficient.

The declared invention differs from the invention, which is disclosed in D1, in that the gate of the main distributor represents by itself a rotating body in a form of a cylinder having an axial opening wherein at equal distances from the ends of the cylinder two identical discs thinned towards their periphery are formed in such a manner that the gate is symmetrical with respect to the plane crossing perpendicularly the middle of its longitudinal axis, and the interior of the body of the main distributor has the same parameters of symmetry and it is configured in such a manner that only in a neutral position of the gate at both sides of each disc separate chambers insulated from each other are formed, wherein the chambers at each side of the gate are connected with areas of high and low pressure in separate hydraulic loops, in such a manner that the pressures of both loops have opposite directions to the discs of the gate along its longitudinal axis, and the cross point of the longitudinal axis of the gate and its transverse plane of symmetry lies on this side of the rotating axis of the differential which crosses its common driving unit, wherein each of the hydraulic loops includes two main collectors of toroidal configuration, but the control branches have an electromagnetically actuating of their control elements.

Therefore, Claim 1 and the dependent Claims 2 to 3 meet the criterion of novelty.

The devices, which are disclosed in D2 to D5, have no mentioned distinctive features, which in combination with the known features allow to provide with an even distribution of the driving torques for the both directions of rotation upon the improvement of weight parameters and overall dimensions. These features are not obvious ones for a person with the ordinary skills in the art.

Therefore, Claim 1 and the dependent Claims 2 to 5 meet the criterion of inventive step.

All the Claims 1 to 5 meet the criterion of industrial applicability.